



**Clatsop Plains  
Elk Collaborative**

**Declaration of Cooperation**

**Oregon Solutions**

**September 1, 2021**

### **Acknowledgements**

Oregon Solutions greatly appreciates all those who generously gave their time to accomplish this project and achieve this Declaration of Cooperation.

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# Clatsop Plains Elk Collaborative Declaration of Cooperation

## Preface

In April 2019, Oregon Governor Kate Brown designated the Clatsop Plains Elk Collaborative as an Oregon Solutions project following a request initiated by the cities of Gearhart and Warrenton. The governor designated Mayor Henry Balensifer (Warrenton) and Mayor Jay Barber (Seaside) as co-conveners of the project and Oregon Solutions formed a project team of twenty-six members, consisting of key stakeholders, state and federal agency staff, local community and government leaders, academics, Governor's Regional Solutions staff, and area nonprofit representatives to focus on the goals of: *reducing conflict between elk-human interactions, increasing safety, and promoting cohabitation between elk and people in the Clatsop Plains area.*

## Purpose of the Declaration of Cooperation

The Declaration of Cooperation outlines the commitments and actions of the Clatsop Plains Elk Collaborative (the project team). It is designed to align resources that create sustainability towards the project team accomplishing their goals, which are outlined in their recommendations and commitments, forming the general structure for a Clatsop Plains Elk Management Plan. The project team intends to use this Declaration of Cooperation to engage the public and provide them with meaningful information about effective ways they can participate in the implementation of the project team's recommendations.

The results of this Declaration of Cooperation are expected to provide ongoing data and resources which can be used by local jurisdictions, governmental and private sector entities, and other project members in support of their commitments and actions. The Clatsop Plains Elk Collaborative also used a collaborative process to develop a "tool kit," that can be used by other communities in Oregon as a model for how they might approach human/wildlife conflict issues within urban and other land interfaces.

## ABOUT OREGON SOLUTIONS

### About Oregon Solutions

Oregon Solutions is the state of Oregon's program to help communities address community-based problems and opportunities through sustainable solutions. We do this by creating a neutral forum for collaboration where businesses, governments, nonprofits, community-based organizations, sovereigns, and other stakeholders can align resources and pool efforts to achieve desired results.

### Oregon Solutions Process

Oregon Solutions' engagement starts with an assessment. When invited, Oregon Solutions begins an assessment to explore whether and how a collaborative approach might be structured to address a particular community issue. The assessment is composed of a series of one-on-one or small group interviews. If an assessment finds there is a project that can be conducted by Oregon Solutions, it will go before the governor for consideration of a designation as an Oregon Solutions project.

## The Clatsop Plains Elk Collaborative

The Clatsop Plains Elk Collaborative project team was formed in response to the needs of the Greater Clatsop Plains area to identify a better co-habitation approach between people and elk. Much like the region's proactive response to living in a tsunami zone, this project team seeks to develop a comprehensive, multi-sector approach for living in longstanding elk habitat.

To frame its work, the project team developed the following **purpose statement**:

*The community in and around the greater Clatsop Plains study area seeks to reduce elk-human related conflicts. We have expressed a sense of urgency and willingness to work collaboratively to identify management solutions and implementation strategies. The purpose of this collaborative is to find viable ways to improve public safety, and reduce property damage through outreach and education and a community-wide approach to reducing urban elk interactions while maintaining healthy and viable herds as a valuable cultural and natural resource.*

To best approach its work, the project team organized itself into a steering committee and four subcommittees (elk management, human management, land use, and data). The full project team met seven times over the current duration of the project. Subcommittees met on a monthly basis from fall 2019 through spring 2020. The subcommittees developed recommendations to achieve the goals within the purpose statement.

## COVID-19

Work of the project team was paused for four to six weeks at the onset of COVID-19 so team members could attend to more urgent community matters. The team ultimately adjusted to the changed environment, and subcommittees were reconstituted so team members could continue their work to reach agreement on a series of commitments and recommendations.

Due to the changes and reductions in many agency and organizational budgets from the impacts of COVID-19, funding sources that would have been traditionally available to the project to achieve its goals no longer exist. As a result, some commitments made by project team members may be delayed in their implementation. These will be assessed on a case-by-case basis as organization and agency budgets recover.

## Common Understandings

The full project team has developed common understandings from their work together throughout the Oregon Solutions process. These understandings have helped shape the work of the project team and will guide the actions, implementation, and community engagement of the resulting management plan after the completion of the Oregon Solutions

project. Central to these understandings and to the Clatsop Plains Elk Collaborative is the livability and safety of residents and visitors as well as the necessity to develop a unified, cross-jurisdictional approach for the implementation of actions, to the greatest extent possible. These shared common understandings are as follows.

**Status quo is not an option.** The number and density of people who live in and visit the Clatsop Plains area are rising. Elk numbers, especially in urban areas, are also rising. If the status quo remains and no action is taken, the number of elk will exponentially increase and negative interactions and outcomes between elk and people will increase as well. This includes the risk to the health and safety of both elk and humans, from motor vehicle collision injuries/fatalities and direct encounters with aggressive elk to increased potential for attracting large predators, such as cougars, and the spread of disease among elk herds. The project team recognizes that the status quo is not working and there is a resulting urgency to the efforts of this collaborative.

**Patience and action are needed.** The Clatsop Plains communities have been struggling to cohabitate with elk herds in urban areas. After years of growing concern, the project team acknowledges that communities are eager for action. It is hoped that the work of the Clatsop Plains Elk Collaborative and this Declaration of Cooperation will be a turning point toward effective, comprehensive approaches to the problem. Through the group's work, the project team has achieved better clarity on what is necessary to meet the goals of the purpose statement. The group has found that there are few appropriate and effective actions that are capable of producing immediate results. Actions that have the best chance of producing immediate results will be prioritized, but it will likely be three to five years to see significant impacts from the project commitments.

**There is no panacea.** It is the confluence of various strategies in elk and human management, land use policies, and sustained action within these strategies, that will yield the highest likelihood for success. No one tool will serve to solve all problems.

**A unified approach for people is needed.** It is understood that flexibility is necessary, but it is understood that speaking with a coordinated voice and taking unified actions will result in the most effective and impactful outcomes for both elk and the Clatsop Plains communities. Communities will benefit from a unified approach by setting clearer and better expectations for everyone and with easier entry points to participating in the project's goals. It is clear that human behavior can and does cause harm to elk and communities alike, including negatively impacting their neighbors (feeding elk, landscaping that attracts elk, higher potential for traffic collisions, and others) which might require elk to be lethally removed as a result of increased safety hazards. This creates the need for a *community culture* where individuals, businesses, and communities see themselves as responsible for changing some of the ways they live in the Clatsop Plains. The community is called upon to work together to adapt their lives within the Clatsop Plains area to both relieve pressure on elk habitat and make urban areas less attractive for elk. This will be paramount for both short and long-term success.

**A unified approach to elk is needed.** Of course, elk do not acknowledge jurisdictional boundaries. In order for any regulations or guidelines to have measurable and positive impacts, there needs to be *unified and consistent coordination across the jurisdictions* when

considering regulatory measures, best practice guidelines, and other management strategies. There also needs to be an ability for local jurisdictions to adapt ordinances and guidance to address community needs. Development of a communication and notification protocol, as regulations and guidance are being proposed, will ensure a multi-jurisdictional collaborative approach.

**Balanced perspectives on elk are needed.** There is a general understanding that there will be some urban presence of elk and that they may continue to pose a nuisance from time to time. The project team notes that people of goodwill can disagree about what to do about this elk population. They also acknowledge that perceptions, feelings, and experiences with Clatsop Plains elk are diverse and complex, as is resolving elk and human interaction. Noting this, for the greatest possible positive outcome for Clatsop Plains communities, the group believes that elk should not be seen as either a pest or as something to be wholly protected. Elk are a part of the Clatsop Plains ecological landscape as well as an attraction to visitors. Given that livability and safety are central to this project, the needs of humans and elk should be considered before actions are taken.

**The impact of urbanization must be considered.** We understand that elk within urban areas of the Clatsop Plains may need to be reduced from time to time for safety reasons or because of socially unacceptable levels of property damage. We also understand that a significant cause of increased interactions between humans and elk in the Clatsop Plains area results from factors related to urbanization, including elk and human population growth, fragmentation of elk habitat, and landscaping activities that promote forage that elk find desirable. Furthermore, increased road and foot traffic resulting from a larger volume of visitors to the North Coast, coupled with the increase in urban elk, poses a larger risk to motorists, pedestrians, and elk alike. Human activity and development have served to concentrate elk within islands of suitable forage and cover on the fringe of—and often within—developed areas. The frequency of negative human/elk interactions over time has decreased the elk's social acceptance for many residents. The socially acceptable number of elk for Clatsop Plains communities will become clearer over time as the impacts of the management actions are felt.

**Tough choices are ahead.** Creating the best conditions possible for elk and people will require some tough choices. Wildlife management strategies will likely need to be employed to reduce the elk population in the short and long term. This will likely require initial measures such as expanded hunting and culling to reduce the elk population. Culling will require local jurisdictions to pass ordinances granting appropriate permission. It is the project team's expectation that all meat from culling will be donated to local food banks for community benefit, as is required by law. The project team does not anticipate their being an immediate or significant difference in the current situation (safety and co-habitation) without the inclusion of culling in the project commitments. Culling also has its limitations and is seen as only one part of a holistic management approach.

**Everyone has a part to play.** Individuals play a role in creating the best conditions possible for human/elk relationships, as well as state and local agencies. There is no one agency or entity that has full responsibility for the management and outcomes of human/elk issues in the urban areas of the Clatsop Plains. At the same time, the project team acknowledges a



responsibility to help communities become better informed and take ownership where possible. The project team believes working to remove barriers to meaningful community participation and engagement to reduce the presence of elk in urban areas will increase safety and lead to improved cohabitation.

## Recommendations

The project team organized its work through the following subcommittees: elk management, human management, land use, and data. Recommendations were developed in each of the subcommittee areas (except the data subcommittee) related to achieving the overall goals of the project's purpose statement. The project team has agreed to the recommendations below.

### Elk Management Subcommittee

- Develop fencing options for mass elk exclusion from select areas.
- Develop and implement an elk behavior modification plan.
- Use deterrents to detract elk from select areas.
- Use attractants to attract elk to select areas.
- Develop and establish elk movement corridors.
- Evaluate and expand ODFW hunting options.
- Increase targeted use of hazing and hazing permits.
- Conduct culling requested by jurisdictions and donate meat to the Oregon Food Bank system.
- Use targeted removal of individual problem elk to reduce habituated elk that pose an immediate threat to public safety.

### Human Management Subcommittee

- Complete jurisdictional passing of no feeding ordinances.
- Develop comprehensive no feeding guidance.
- Develop and disseminate resident education materials on how to reduce interactions with elk.
- Work with residents on using best practices for elk appropriate landscaping and pet care.
- Develop and implement K-12 education materials, in coordination with local schools, to teach children about the history of elk in the Clatsop Plains, elk biology, and how to live with elk as residents of the Clatsop Plains.
- Develop and disseminate visitor educational materials in collaboration with relevant partners.
- Develop creative and effective fencing options for homeowners.
- Develop and disseminate guidance on maintaining a safe distance from elk.
- Establish new signage and investigate placing rumble strips at highly trafficked elk crossing areas on US Highway 101. Explore the development of signage that is reactive to the presence of wildlife.

## Land Use Subcommittee

Establishing and preserving elk movement corridors, habitat, and buffer areas:

- Through partnerships, identify, consolidate, and maintain, in an undeveloped state, targeted land used for elk travel.
- Review subdivision ordinances.
- Establish wildlife habitat buffers or transition areas between urban communities and elk habitat.
- Use enhanced forage to attract elk to select areas for viewing and using corridors.

Legislative and regulatory revisions:

- Integrate land use recommendations into the Clatsop County Comprehensive Plan update process.
- Review the density transfer plan of Clatsop County.

Resident and jurisdiction education actions:

- Coordinate with private landowners who may be converting forest land to residential land on potential elk conflicts.
- Provide notice if future purchasers' properties are in a wildlife movement area.
- Encourage flexibility while striving for a unified approach.
- Identify human/wildlife transect areas and send public notices to ODFW.
- Develop local fencing guidance in coordination with the development of fencing options and adjust ordinances as needed.
- Identify and create wildlife viewing areas.
- Educate residents and decision makers on the relationship between land use planning and wildlife interactions.
- Improve local jurisdictions' understanding of statewide processes and permitting relating to land conversion, particularly in municipalities.

## Data Collection Subcommittee

- Increase collection and analysis of elk movement data to create and protect elk movement corridors and inform other land use actions.
- Track elk movement on both sides of Highway 101 to better understand landscape usage.
- Create a GIS layered map to inform other land use actions.

## Project Team Commitments and Declaration

In order to achieve the goals outlined in the purpose statement of the project, the members of the project team commit, individually and together, to implement the elk management plan through the current recommendations, and to explore new ideas as new information arises. The members of the project team agree to support one another and advocate for each other in achieving the following commitments, collaboratively addressing challenges, involving the public through robust education on the management plan and opportunities to participate, and speaking with one voice to provide clarity and stability to the public.

*This Declaration of Cooperation is not a binding legal contract. It is a declaration of good faith and commitment to collaboration of the undersigned parties to meet the spirit and goals of the project through individual and collective action.*

City of Warrenton

- Review and, if necessary, amend laws related to unhealthy elk-human interactions, such as feeding, petting, and enticement.
- Increase enforcement of no feeding ordinance.
- Conduct public hearings and cooperatively work with Oregon State Police (OSP), ODFW, and relevant agencies on developing and implementing a population management plan, including elk harvests.
- Consider adoption and implementation of land use policy recommendations that reduce elk/human interaction.
- Collaborate on fencing design appropriateness for the Clatsop Plains area and for individual communities.
- Collaborate on elk and ecologically appropriate landscaping, and other mechanisms, for deterring elk in urban areas within Clatsop Plains.
- Help identify and troubleshoot land development issues with the need for wildlife corridors in mind.
- Consider changing local fencing ordinance to accommodate updated elk fencing designs for residents.
- Assist in developing and distributing new educational materials and guidance on elk safety.
- Support Clatsop County in educating residents and decision makers on relationship between land use planning and wildlife interactions.
- Partner with appropriate entities to help link elk movement corridors through Warrenton to parks and state lands.
- Review development policies as they relate to elk and work with property owners and agencies to consider land use changes that would alleviate pressure on elk habitat.
- Identify wildlife transect areas within Warrenton, and then determine need for new policy or policy changes.
- Collect more precise data on elk contact with residents and provide that information to ODFW.
- Consider updating policies on firearms and hazing to align with the elk management plan.
- Discuss with Spruce Up Warrenton, or another community organization, the creation of a regional Elk Festival.

Henry Balensifer III, Mayor:



Date: Sept. 1, 2021

City of Seaside

- Consider appropriate ordinances and Land Use issues related to elk/human interactions and safety.
- Invite representative members from the Clatsop Plains Elk Collaborative to provide an informational presentation to the Seaside City Council and the Seaside Parks Advisory Committee.
- Create digital tourism-focused educational brochures and materials on elk, in coordination with other jurisdictions, including the visitors guide and the city of Seaside web page. Educational materials will include safe distancing from elk, taking photos of elk, stopping a car on the highway or road to observe elk, seasonal elk issues (calving and rutting seasons), and other topics.
- Coordinate with the Oregon Coast Visitors Association, Astoria, and Cannon Beach on collaborative marketing materials related to elk education.
- Explore creation of an elk information kiosk next to the Seaside sign.
- Reach out to chamber of commerce, service clubs, seaside business association, and others, to do a presentation on the elk project. Communicate around how they can contribute to the elk project.
- Use vacation rental dwelling compliance officer to work with vacation rentals, creating and making available materials to be placed in vacation rentals and to give to renters.

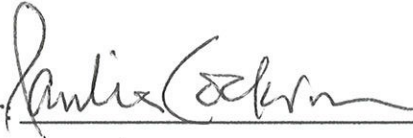
Jay Barber, Mayor:

 Date: 9/1/21

City of Gearhart

- Review and collaborate with other jurisdictions on regulations relating to the hazing of elk that are damaging property or endangering a person's safety.
- Consider actions to "right size" the Gearhart herd(s). This includes consideration of passing city council resolutions supporting culling of elk outside of city limits on appropriate land in unincorporated Clatsop County.
- Consider whether to revise the city's fence code section to deter elk from entering property.
- Consider whether to revise the city's fence code sections, to allow Gearhart to Golf Link to participate in a "double fence" experiment.
- Collaborate on ecologically appropriate landscaping, and other mechanisms, for deterring elk in urban areas within Clatsop Plains.
- Support Clatsop County in educating residents and decision makers on relationship between land use and wildlife interactions.
- Partner with appropriate entities to study whether elk movement corridors can be utilized in Gearhart, particularly in parks and on state lands.
- Review current subdivision ordinances to consider land use amendments (space requirements, wildlife buffers, and others) that might alleviate pressure on elk habitat.
- Collect more precise data on elk contact with residents and provide that information to ODFW.

Paulina Cockrum, Mayor



Date:

Sept 1, 2021

## Clatsop County

- Pass a county no feeding ordinance for areas west of Highway 101.
- Assist in the guidance and education of residents and visitors for elk safety, landscaping, and best practices for pets. Support the development of content, printed materials, and community outreach.
- Conduct community outreach and education for residents regarding elk fencing options.
- Identify land to be maintained in an undeveloped state for the purpose of creating wildlife corridors, open space requirements for subdivisions, and other practices that will decrease pressure on elk habitat. Build necessary partnerships for support and implementation.
- Review subdivision ordinances, develop an educational campaign, and work with private property owners to build support for requiring minimum open space requirements and regulations that provide adequate elk habitat and forage within and between adjacent developments.
- Integrate land use issues identified by the Clatsop Plains Elk Collaborative into the Clatsop County Comprehensive Plan update process. Use the Clatsop Plains Elk Collaborative Declaration of Cooperation as consideration and guidance for zoning code discussions (open space requirements, locations, designs) and density transfer discussions.
- Develop and implement an informal process of coordinating with and notifying developers and private landowners of the presence of elk in areas they may be converting from a more natural area to a residential or commercial area.
  - Ensure developers and land owners are aware of wildlife buffers and other land use recommendations from the Clatsop Plains Elk Collaborative.
  - Provide an additional disclaimer of elk presence over the counter and on building permits. Provide area mapping of wildlife areas in conjunction with notifications.
  - Work with real estate agents and build support for notifying potential buyers of the presence of wildlife where they are buying or setting up businesses.
- Work with real estate agencies and the business community to add wildlife (elk) area advisory statements and notifications for over the counter transactions, on the bottom of permits, and on property records. Add wildlife (elk) designation areas to Clatsop County maps and public viewing website.
- Provide all notices for conditional use permits to ODFW, for use in making comments outside of big game habitat.
- Assist in education and outreach in Warrenton and Gearhart to inform the public and local officials on the relationship between land use planning and wildlife interactions.
- House and administer a GIS layered map for the Clatsop Plains Elk Collaborative.
- Review the density transfer program and adjust as needed to disperse density transfers throughout appropriate areas of unincorporated Clatsop County.
- Support requests for culling permits made by cities within the Clatsop Plains area that would be conducted on unincorporated land outside of city limits when the elk

are understood to be biologically attached to the city making the request. This does not require a formal resolution.

- Consider passing a formal resolution for a culling permit from ODFW when requests are made by private entities relating to those elk on unincorporated land that are not biologically attached to a city.

Mark Kujala, Clatsop County Commission Chair: Mark Kujala Date: 9/1/21



Oregon Department of Fish and Wildlife (ODFW)

- Conduct increased public outreach and education on all issues related to elk management in the Clatsop Plains.
- Create and distribute no feeding guidance.
- Provide guidance to jurisdictions that have not yet passed a no feeding ordinance.
- Continue phase two of research on double fencing design. Create an experimental design to be tested in partnership with Gearhart Golf Links.
- Provide technical advice to landowners, jurisdictions, agencies, and organizations that would like to implement the use of elk attractants and deterrents.
- Increase collaring for data collection used to identify and create elk movement corridors.
- Provide technical assistance in the creation of an elk behavior modification plan.
- Research and advise on aligning interpretations of no shooting and discharge of firearms rules in city limits. Work with jurisdictions on alignment and consistent application of hazing where possible.
- Adapt hunting options to new information on seasonally problematic elk that come into areas where they could be hunted through increasing tag numbers or creating special hunting seasons.
- Provide guidance and technical support to local governments for development of culling plans. Collaborate with project team members on best methods and locations for culling.
- Inform project team members on ODFW\Oregon State Police protocols and activities regarding targeted removal of problem elk. Discuss proactive ways for dealing with elk that exhibit problem behaviors but do not yet present an immediate safety risk.

Bernadette Graham-Hudson, West Region Supervisor:

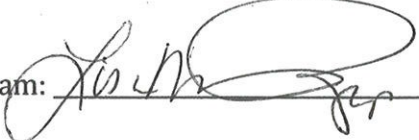
Date: 9/1/21



Oregon Department of Land Conservation and Development (DLCD)

- Support and review ordinance changes, including fencing rules, that may also involve building code or other land use requirements, and vegetation ordinances addressing elk attractants, deterrents, and landscaping. Ordinance changes may also trigger Post-Acknowledgement Plan Amendment processes through which DLCD can provide input to local jurisdictions to ensure compliance with the statewide planning goals.
- Review and edit materials involving no feeding guidance and options, safe distance guidance, and resident, K-12, and visitor education.
- Liaison on any actions related to identifying and consolidating and/or maintaining land used for elk movement in an undeveloped state, reviewing subdivision ordinances, and reviewing density transfer plans.
- Engage with comprehensive plan review Goal 5 expert to develop clear and objective standards for how the Clatsop Plains Elk Project GIS map information will be used in land use decision making and integrated within the comprehensive plan review. Areas of special attention will include collecting and analyzing elk movement data to establish and protect corridors as well as tracking elk and elk movement on both sides of Highway 101 to better understand landscape usage. Assist, as needed, in integrating elk recommendations into Clatsop County's Comprehensive Plan review.
- Support Clatsop County and ODFW in coordinating with private landowners who may be converting forestland to residential land, providing notice if future purchasers' properties are in a wildlife movement area, and identifying human/wildlife transect areas, and support Clatsop County's efforts to send public notices to ODFW.
- Provide input and participate in public and local government education on the relationship between land use planning and wildlife interactions.
- Assist jurisdictions that want to pass local codes which install time restrictions on the conversion of forest land to residential or commercial use.

Patricia L. Snow, DLCD Coastal Program Manager:  Date: 9-1-21

Lisa Phipps, DLCD Regional Solutions Team:  Date: 9-1-21

Oregon Department of Transportation (ODOT)

- Modify ODOT elk data collection procedures within the Clatsop Plains (Highways US 101, US 101B, US 104, and US 105) to consistently and accurately record the pickup location to the nearest one-tenth milepost.
- Investigate and pursue additional mitigation measures to reduce vehicle speeds and potential elk/vehicle collisions within the Clatsop Plains.
  - Research and implement, if possible, additional low-cost passive and active warning measures.
  - Pursue a university partnership to research wildlife detection technologies and systems capable of coping with the complexities of the Clatsop Plains environment. The desired outcome of the research would be a detection system that could be used for a dynamic warning system able to alert drivers of the presence of wildlife on or near the roadway. The wildlife detection system could also be used by other agencies, (e.g., ODFW and National Park Service) for improved natural habitat wildlife detection, identification, and tracking.

Sonny Chickering, Region 2 Manager:

Sonny PA Chickering Date: 9-1-21

National Park Service (Lewis and Clark National Historical Park)

- Seek funding for continuing studies and collect more detailed data for elk movement. Seek other technologies in addition to collars, such as camera traps, satellite tags, and others as they become known.
- Provide guidance to park visitors about not feeding and maintaining safe distances from elk.
- Support Oregon State University Extension in developing a backyard habitat program by providing technical guidance. Seek involvement of the North Coast Watershed Association.
- Provide elk-specific education materials and interpretation to park visitors through materials created and provided by the Clatsop Plains Elk Collaborative as well as existing National Park Service materials.
- Provide "Nature Matters" speakers series, hosted in collaboration with the North Coast Watershed Association, the Lewis and Clark National Historical Park Association, and Fort George Brewery, as a venue for presentations to the public on the Clatsop Plains Elk Collaborative's mission and goals.

Jon Burpee, Superintendent:

*acting*


*[Handwritten Signature]*

Date: *9/1/2024*

Oregon Parks and Recreation Department (Fort Stevens)

- Conduct interpretive and management plan education and outreach on elk for visitors and locals by developing and providing interpretive panels, pamphlets, and expert presentations.
- Add elk messaging in the Fort Stevens reservation system that details the Clatsop Plains Elk Project management plan and reinforces the park's existing Oregon administrative rule against harassing or feeding wildlife.
- Provide signs, developed by the project team, in areas where elk are known to congregate and cross in the park, restricting people from stopping their cars.
- Enhance forage habitat for elk at Fort Stevens.
- Use park land to partner in conducting research on elk deterrents and attractants, elk corridor and movement strategies, fencing options, and hazing.
- Coordinate on the use of Fort Stevens land as part of elk movement corridors.

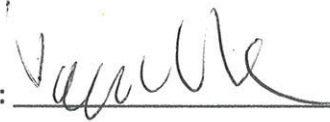
Lisa Sumption  
Lisa Sumption, Director: Lisa Sumption (Sep 28, 2021 14:48 PDT) Date: 09/28/21

Justin Parker, North Coast Dist. Manager:  Date: 09/01/2021

Vanessa Blackstone (Formerly with Oregon Parks and Recreation—Fort Stevens)

- Develop and assist in implementing an Elk Behavior Modification Plan for the Clatsop Plains project area.
- Partner with OSU Extension, ODFW, OSP, Ken Ramirez (animal training expert), and others to assist in the creation and implementation of an Elk Behavior Modification Plan.

Vanessa Blackstone, Wildlife Ecologist:



Date:

9/1/21

Oregon State Police (OSP)

- Partner with jurisdictions to improve and encourage consistent enforcement of no feeding ordinances.
- Work with ODFW and jurisdictions to conduct outreach and education, for residents and businesses, on the Clatsop Plains Elk Management Plan and OSP's role in enforcing laws connected to the plan.
- Assist ODFW in educating residents and visitors about the dangers of feeding wildlife and the increased chance that elk will become subject to targeted lethal removal because of habituation through feeding. Conduct education in schools.
- Collaborate with ODFW and jurisdictions on aligning legal interpretations rules relating to hazing, shooting, and discharge of firearms in city limits. Work with jurisdictions on consistent application and enforcement of hazing.
- Create more detailed data and additional metrics on vehicle collisions in partnership with ODOT. Coordinate with ODOT to get more consistent data on elk collisions for GIS mapping
- Enforce any additional state highway signage or laws that may result from this project which require reduction in speed or restrictions on stopping to view wildlife.
- Continue to coordinate with ODFW for targeted removal of elk determined to be an immediate threat to public safety.
- Provide emergency response perspectives in discussing proactive ways that elk may be dealt with when they exhibit problem behaviors but do not yet present an immediate safety risk.

Sgt. Joe Warwick, Oregon State Police Officer:

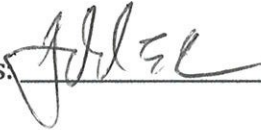


Date: 9/1/21

Oregon Military Department (Camp Rilea)

- Camp Rilea serves the primary purpose of military readiness and, to the best of the Oregon Military Department's ability, will manage elk and elk habitat at Camp Rilea and cooperate with proper authorities, as appropriate, for their requests to cull and perform other types of lethal removal of elk.
- Serve on advisory committee in creating and implementing the elk behavior modification plan, especially in the use of attractants, deterrents, and hazing. Use these tools to enable the movement of elk onto Camp Rilea land.
- Act with project team members to integrate Camp Rilea into a planned elk movement corridor.
- Work with ODOT on the placement of mitigation measures to reduce speed and reduce potential collisions with elk at elk crossing areas along Camp Rilea's frontage to US Highway 101.
- When other options are not available, and as a last resort, provide refrigeration space for unprocessed elk after culling process.
- Pursue Army Compatible Use Buffer program opportunities to partner with landowners and project team members in identifying and purchasing land for habitat conservation, elk movement corridor, and preventing development of critical open areas.
- Provide ODFW access to Camp Rilea for data collection and darting and collaring elk.
- Support GIS mapping and analysis with in-house staff time.

Todd Farmer, Deputy Director of Installations:



Date: 1 SEP 21



Oregon Department of Forestry (ODF)

- Increase education, communication, and coordination on land use conversion within the Forest Practices Act. Assist jurisdictions that want to pass local codes that install time restrictions on the conversion of forestland to residential or commercial use.
  - Make sure notifications comply with the Forest Practices Act.
  - Distribute literature to individuals who file a notification of operation within the project area about existing and new rules and restrictions that may apply to landowner activities.
  - Talk with local officials about past issues regarding land use conversion in those jurisdictions and the potential effectiveness (or not) of any new proposed rule.

Dan Goody, Astoria District Forester:

Dan Goody

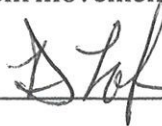
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Columbia River Estuary Study Taskforce (CREST)

- Provide ongoing administrative project support, for two to three years, for the Clatsop Plains Elk project. Help coordinate communication, hold quarterly meetings, create agendas, write meeting minutes, and track progress on project goals.
- Assist with grant writing for elk movement corridors and habitat preservation.

Denise Löffman, Executive Director:



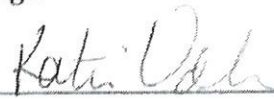
Date:

9/1/21

## North Coast Land Conservancy (NCLC)

- Help identify and establish elk movement corridors.
  - Work to protect these areas from development by establishing them as public land, open spaces, or private nature reserves if necessary and possible.
  - Explore taking ownership of land to help establish elk movement corridors.
- Partner with municipalities and Clatsop County to “Identify, consolidate, and maintain in undeveloped state land used for elk movement through partnerships,” “Review subdivision ordinances,” and “establish wildlife habitat buffers or transition areas between urban communities and elk habitat” to reduce presence of elk in urban spaces. Work with developers when they are complying with open space requirements and endangered species requirements that can also benefit elk movement and habitat, including receiving land from donors.
- Provide access and use of NCLC land in elk data collection, including collaring and pellet surveying. Make staff biologists available to assist with these efforts.
- Make staff available for GIS mapping work.
- Work with schools, and the general public, in elk education by offering field trips and “walk in the land” guided nature tours through NCLC land.
  - Partner with the North Coast Watershed Association, OPRD, and National Park Service on interpretation. Review signage for facts and relevance.
- Explore the establishment of a wildlife viewing area on NCLC land.
  - Initial viable sites to explore include: Reed Ranch, the Neocoxie Forest, and Gearhart Glen.
  - Partner with local land owners or municipalities in resolving potential access issues and space usage.

Katie Voelke, Executive Director:



Date: 9.28.21

Oregon State University (OSU) Extension Services

- Integrate the participation of graduate and post-doctoral students at strategic points to build capacity for the implementation of project goals.
- Assist in the construction of an elk guidance document and comprehensive FAQs sheet that answers common questions about wildlife management in general and in urban areas. Work with project partners to solicit questions from local jurisdictions.
- Partner with the OSU Master Gardeners program, and local plant nurseries and landscaping companies, on designs and guides that emphasize aesthetically pleasing, ecologically native plants that are undesirable to elk.
- Assist in holding educational workshops with local gardening clubs, businesses, and residents to adopt the use of elk appropriate plants and landscaping.
- Assist in the creation of an elk behavior modification plan.
- Create a naturalist/interpreter program related to elk.
- Work with state and national parks on interpretation as well as local indigenous communities in traditional ecological knowledge contributions.
- Create an elk section on OSU's coastal extension webpage that includes the comprehensive FAQs sheet.
- Design and implement research on one or more of the following items: space use patterns of local elk herds, impacts of an elk behavior modification plan, points of highway crossing for local elk herds, resident and visitor values/knowledge/attitudes/behaviors regarding elk and willingness to adopt/change behaviors in relation to elk presence and behavior.

Anita Nina Azarenko, Vice Provost for Extension and Engagement/Director of the Extension Service, Interim: Anita Nina Azarenko Date: 1 Sept 21

Dr. Dana Sanchez, Associate Professor, Extension Wildlife Specialist:

Dr. Dana Sanchez Date: 9/1/2021

## Greenwood Resources

- Make use of attractants like enhanced forage to enrich elk habitat on the east side of US Highway 101.
- Coordinate with local jurisdictions and land conservation organizations in integrating Greenwood Resources land into wildlife corridor plans.
- Allow hunting on Greenwood Resources property in conjunction with efforts to reduce the presence of elk on the west side of US Highway 101. Partner with the Oregon Hunters Association and ODFW.
- Assist in developing and delivering education on the intersection of forestry and elk management.
- Collaborate with OSU Extension, and others, in research to better understand the connection between elk behavior, elk numbers, elk habitat, and elk migration.
- Offer Greenwood Resources property for conducting research and habitat modeling.
- Offer space as needed to continue development of fencing design options.
- Integrate the work of the Clatsop Plains Elk Collaborative into the Greenwood Resources Wildlife Management Plan.
- Support efforts in retaining timberland and reducing the conversion of timberland to residential use.
- Develop an official program and space for viewing elk.
  - Use current permit system for access to Greenwood Resources land.
  - Offer educational materials that exhibit how forest management practices can benefit conservation and wildlife. These materials would be available for self-guided elk-viewing tours (walking and biking) on specified areas of lands managed by Lewis and Clark Timberlands.

Kat Olson, Lead Silviculturist:



Date:

09/01/2021

Gearhart Golf Links

- Post and redistribute elk educational material.
- Formulate questions and gather guest experiences on elk for research purposes.
- Educate golfers on aspects of the project implementation that relate to their conduct and experience on the golf course.
- Support local and county efforts in land use changes that seek to reduce the presence of herds in urban areas, including fencing used for elk movement corridors.
- Act as a bridge to important community relationships, including other golf courses, in helping to understand and gain support for the implementation of project recommendations.
- Work with ODFW to apply fencing research to golf course grounds. Use the northeast portion of the golf course as a test site for double fencing or use another location, depending on suitable aesthetics.

Jason Bangild, General Manager:



Date:

8-1-21

Oregon Hunters Association (OHA)

- Supply OHA members and equipment for costs and work associated with habitat management and manipulation, establishing elk movement corridors, fencing, and elk attractants/deterrents.
- Establish a fund under OHA's 501c3 status to collect and distribute money related to project costs, vetted and approved by OHA through a proposal process and matched funding system. OHA has committed an initial \$5000 to this fund.
- Serve on advisory committee in creating and implementing an elk behavior modification plan
- Coordinate with ODFW and landowners on hunts in strategic locations to encourage elk to remain on the east side of US Highway 101.
- Pilot discussions on new and expanded hunting options with ODFW, OSP, and local jurisdictions.
- Publish articles in OHA membership magazine (state) and newsletter (local) to educate and inform OHA membership on the Clatsop Plains Elk Collaborative and its implementation.
- Develop a field dressing/rendering curriculum and program that can educate and be used by volunteers to reduce costs associated with culling operations.

Fred Walasavage, Oregon Hunters Association State Board Chair


*Fred Walasavage*  
(John R. Putman, Authorized Agent): *By John R. Putman* Date: *9/1/2021*

John R. Putman, Northwest Director: *John R. Putman* Date: *9/1/2021*

Regional Solutions

Continue to assist with state agency coordination and integration as needed for collaborative governance, technical assistance, information sharing, and regulatory considerations in support of the Clatsop Plains Elk Collaborative, aligning state and regional priorities with the recommendations and commitments of the project.

Jennifer Purcell, North Coast Team Coordinator:

 Date: 9-1-2021



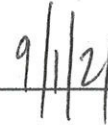
Oregon Senator Betsy Johnson

As both an elected representative and a private citizen, support the agreement of the Clatsop Plains Elk Collaborative and to work through whatever unanticipated issues may arise in its execution. Drawing on prior experience as an Oregon Solutions Convener and Project Team member, make sure all stakeholder voices continue to be valued and heard.

Senator Betsy Johnson, District 16:



Date:



Oregon Solutions

- Highlight the Clatsop Plains Elk Collaborative project on the Oregon Solutions website and in other promotional materials.
- Act as project manager, for one year, in a second phase of the Clatsop Plains Elk Collaborative. The scope of work will target support for budget creation and tracking, project implementation work plan creation and coordination, and procurement of project funding.
- Perform post-project evaluation and share a summary of what was learned from the evaluation with the project team.

Karmen Fore, Director:



Date:

9. 1. 2021

## **Phase Two**

The Clatsop Plains Elk Collaborative has agreed, through the approval process of this Declaration of Cooperation, to participate in a phase two of this project. All signers have agreed to participate in phase two, which will take place over the course of approximately twelve months and will primarily entail the creation of a detailed work plan, launch of the implementation of near-term objectives, establishment of and further work with community and other project partners, and seeking of funding options for unfunded budget items related to their commitments.

## **Reconvening**

Oregon Solutions will reconvene the Clatsop Plains Elk Collaborative in twelve months to eighteen months after phase two has been completed in order to evaluate progress, support the team in addressing any outstanding issues, and assist in the development of any potential additional phases of the project.

## Appendix A: Background

The Greater Clatsop Plains area of northwest Clatsop County is bordered by the Pacific Ocean to the west, the city of Seaside to the south, the Columbia River to the north, and the Oregon Coast Highway 101/Lewis and Clark Road to the east. The area was historically occupied by Roosevelt elk, which are detailed as an important food source in both indigenous records as well as Lewis and Clark expedition records. Over the span of 100 years, the once plentiful Roosevelt elk were extirpated in Clatsop County as the result of years of uncontrolled market hunting and trade.

In the early 1970s, Roosevelt elk began to recolonize the Greater Clatsop Plains area. Several hundred elk now live in the area, and thrive on an array of public and private land. In the last century, communities within the Greater Clatsop Plains have also changed from natural resources-based to tourism-driven economies. All the while, the area has continued to be developed for residential and commercial purposes.

Human-elk conflicts have been present on the Greater Clatsop Plains since the elk returned in the 1970s. But these interactions and conflicts have increased with the corresponding growth in both elk and human populations and ongoing land development. This has resulted in the habituation of elk in urban communities, meaning these elk no longer avoid humans at distances that curtail dangerous interactions. Elk habituation has led to tensions and concerns for both human and elk safety. Concern has also grown because of an increase in inappropriate human behavior around elk (e.g., approaching too close, taunting and harassing, and intentionally and unintentionally feeding the elk); property and land damage caused by elk; elk aggression toward people (especially during calving and rutting seasons); and, elk/vehicle collisions.

All of these changing factors have resulted in divergent opinions and emotions about the presence of elk. Some residents and visitors enjoy the elk and see them as a value-added natural resource that speaks to the biological diversity of the region, whereas others have a diminished tolerance for the elk in the wake of human/elk conflicts and have grown to view them, primarily, as a public safety hazard.

In response, the Oregon Department of Fish and Wildlife (ODFW) has, for many years, assisted Greater Clatsop Plains landowners with advice, hazing permits, and lethal and non-lethal removal of individual problem elk. ODFW has also worked with area cities on public education about how to reduce elk habituation and has advised cities on management actions to reduce the elk population. But in a region where public opinion about the elk is strongly divided, it has been difficult for the agency to proactively manage elk. As a consequence, a cohesive management strategy has yet to be achieved. It has also become clear that no single entity has the authority or capacity to develop and implement such a plan, so a collaborative approach by all stakeholders was necessary.

## Appendix B: Clatsop Plains Elk Collaborative Members

Paul Atwood, Oregon Department of Fish and Wildlife, District Wildlife Biologist

Mark Baldwin, City of Warrenton Commissioner

Mayor Henry A. Balensifer III, City of Warrenton Mayor (Co-Convener)

Jason Bangild, Gearhart Golf Links, General Manager/Director of Golf

Mayor Jay Barber, City of Seaside Mayor (Co-Convener)

Vanessa Blackstone, Wildlife Ecologist

Carla Cole, National Park Service, Lewis and Clark National Historical Park, Acting Chief of Resources

Todd Farmer, Oregon Military Department, Camp Rilea Deputy Director, Installations

Stacey Garrison, Oregon Military Department, Camp Rilea Installations Division (AGI)

Dan Goody, Oregon Department of Forestry, Astoria District Forester

Gail Henrikson, Clatsop County Director, Community Development

Sen. Betsy Johnson, Oregon State Senate, District 16

Chris Knutsen, Oregon Department of Fish and Wildlife, North Coast Watershed District Manager

Denise Löfman, Columbia River Estuary Study Taskforce, Executive Director

Mark Morgans, Greenwood Resources, Director of North American Operations

Kat Olson, Greenwood Resources, Lewis & Clark Timberlands Lead Silviculturist

Justin Parker, Oregon Parks and Recreation Department, Fort Stevens, OPRD North Coast District Manager

Lisa Phipps, Oregon Department of Land Conservation and Development, Regional Solutions Team

Sgt. Jim Pierce, City of Warrenton Police, Police Sargent

Jae Pudewell, Oregon Department of Transportation, Regional Solutions Team

Jennifer Purcell, North Coast Regional Solutions, Gov. Kate Brown Regional Solutions Team Coordinator

John R. Putman, Oregon Hunters Association, Northwest Director

Dr. Dana Sanchez, Oregon State University Extension Services, Wildlife Management Specialist

Chad Sweet, City of Gearhart, City Administrator

Katie Voelke, North Coast Land Conservancy, Executive Director

Sgt. Joe Warwick, Oregon State Police, Fish & Wildlife Division, State Police Sargent

Ty Williams, Oregon Department of Forestry, District Operations Coordinator

### Subcommittee Members

#### *Steering Team*

Mayor Henry Balensifer III, City of Warrenton

Mayor Jay Barber, City of Seaside

Gail Henrikson, Clatsop County

Carla Cole, National Park Service

Paul Atwood, Oregon Department of Fish and Wildlife

Chad Sweet, City of Gearhart

#### *Elk Management Sub-Committee*

Paul Atwood, Oregon Department of Fish and Wildlife

Jason Bangild, Gearhart Golf Links

John Putman, Oregon Hunters Association

Kat Olson, Greenwood Resources

Sgt. Joe Warwick, Oregon State Police

Vanessa Blackstone, Wildlife subject matter expert

Steve Meshke, Clatsop County

Mark Baldwin, City of Warrenton

Dr. Dana Sanchez, Oregon State University

#### *Human Management Sub-Committee*

Chad Sweet, City of Gearhart

Jay Barber, City of Seaside

Denise Löffman, Columbia River Estuary Study Taskforce

Lisa Phipps, Oregon Department of Land Conservation and Development

Gail Henrikson, Clatsop County

Stacey Garrison, Oregon Military Department

Dr. Dana Sanchez, Oregon State University

*Land Use Management Sub-Committee*

Lisa Phipps, Oregon Department of Land Conservation and Development

Gail Henrikson, Clatsop County

Denise Löfman, Columbia River Estuary Study Taskforce

Chris Knutsen, Oregon Department of Fish and Wildlife

Paul Atwood, Oregon Department of Fish and Wildlife

Jae Pudewell, Oregon Department of Transportation

Ty Williams, Oregon Department of Forestry

Mayor Henry Balensifer, City of Warrenton

*Data Sub-committee*

Mayor Henry Balensifer, City of Warrenton

Jae Pudewell, Oregon Department of Transportation

Carla Cole, National Parks Service

Chris Clatterbuck, National Parks Service

## Appendix C: Team Ground Rules

- We agree to approach problems with humility and adaptability. We will inevitably make mistakes, and we will learn from these mistakes, make corrections, and not place blame.
- We commit to openly communicate ideas, potential contributions, and concerns, and also commit to engage in respectful, active listening to each other.
- We recognize that we each have a unique perspective and contribution to make, whether it is expertise, labor, money, in-kind services, etc.
- We recognize that we must endeavor to involve any person or group who could influence and support our ability to achieve our goals.
- We agree to creatively explore solutions.
- We agree to focus on taking specific, concrete steps towards long-term, systematic outcomes.



Appendix D: Map of the Project Area



## BUDGET

The budget for implementation of this Declaration of Cooperation is available on the Oregon Solutions website at <https://orsolutions.org/osproject/clatsop-plains-elk-collaborative-assessment> or by request from Oregon Solutions Project Manager Manuel Padilla at [manuelpadilla@pdx.edu](mailto:manuelpadilla@pdx.edu).

# Elk Management Intervention Toolkit

In support of the Oregon Solutions Clatsop Plains Elk Collaborative

December 8, 2021

Elk Management Subcommittee

Paul Atwood, Oregon Department of Fish and Wildlife

Jason Bangild, Gearhart Golf Links

John Putman, Oregon Hunters Association

Kat Olsen, Greenwood Resources

Sgt. Joe Warwick, Oregon State Police, Fish & Wildlife Division

Vanessa Blackstone, Wildlife Ecologist

Steve Meshke, Clatsop County

Mark Baldwin, City of Warrenton

Dr. Dana Sanchez, Oregon State University Extension Services

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# 1 INTRODUCTION

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The Oregon Solutions (Clatsop Plains Elk Collaborative) is seeking a comprehensive and creative plan to address chronic elk-human conflict in the Greater Clatsop Plains of Northwest Oregon. Negative elk-human interactions have been escalating in the area for the last decade, resulting in increasing public safety issues, elk-related property damage, and human-borne habituation of native elk. At the same time, the presence of elk in the Greater Clatsop Plains is an asset to the communities and ecosystems, with strong public support for retaining elk in the landscape. Finding a path that reduces conflicts, improves public safety, and improves the health and behavior of the elk herd, while complex, is the overarching goal of the Clatsop Plains Elk Collaborative. In order to efficiently and thoroughly address the challenge, the Clatsop Plains Elk Collaborative created Subcommittees for four topics: elk management, human management, data, and land use. The Elk Management Subcommittee's goal was to create a comprehensive Elk Intervention Toolkit of all possible actions that could be used to reduce the incidence of negative elk-human interactions, even if those options do not appear feasible for the Greater Clatsop Plains area. This results in a Toolkit that can be easily adapted in other parts of Oregon, or even other states. The Toolkit focuses specifically on elk management actions; actions that involve changes to human behavior or land use were addressed by those Subcommittees. Once compiled, each action was discussed and evaluated, and a list of recommendations that are likely to result in improved human-elk co-existence specific to the Greater Clatsop Plains was selected for presentation to the Clatsop Plains Elk Collaborative.

## 1.1 CLATSOP PLAINS ELK

Oregon's elk are valued by Oregonians for their aesthetic, cultural significance, economic, impact on tourism, and for their place in the ecosystem. The Greater Clatsop Plains elk are members of the Roosevelt subspecies, the largest-bodied group of elk in the United States. Mature males weigh in at 700-1100 lbs. and females weigh 580-630 lbs. Elk have been an important component in the Clatsop Plains' natural and human systems for centuries, critical to the forests and fields, indigenous peoples, and even as the life-saving resource that enabled the Lewis and Clark expedition to survive the winter of 1805-06.

Elk form reflects functional needs: their herbivorous diet created a skull specialized to clip and grind plant tissues, saliva that reduces the effects of plants' defensive chemicals, a four-chambered digestive system that incorporates microbes that digest nutrients that mammals otherwise cannot, and finally, cud-chewing behavior that helps maximize the nutritional gains of rumination. These features are adapted to the native plants of the Pacific Northwest, and are also very well-suited to decimating non-native landscaping.

Elk form complex relationships with plant communities on landscapes affected by natural and human-caused disturbances that changes vegetation availability. Elk select diets for both volume and quality to maximize nutritional gain from the seasonally-available sources of vegetation matter. They eat grass, forbs, and considerable amounts of browse, or the most nutritious twigs and leaves of shrubs – and fertilized landscape plants will attract the discerning elk palate. Elk breed August-October, known as the rut. Bulls (males) compete to gather and breed as many cows (females) as they can; their level of aggressive energy can be explosive, and easily misdirects against humans, vehicles, and pets during this

time period. Fat stored during summer helps tide animals through the energy-drain in fall and winter. Reduced amounts of nutritious native forage often push elk into maintained landscapes. Cows generally begin breeding during their third fall and give birth in May-June, and this time period is also susceptible to negative human-elk interactions. Cow elk are vigorous and well-armed mothers fixated on any dangers to their calves, perceived or real. Nursing and defense are energetically-expensive activities, so cow elk are hard-pressed from late winter through summer to get enough to eat for themselves, their young calves, and pack on fat to survive the next winter. Although large-bodied and well-armed for self-protection, elk experience their lives as prey animals: they are expecting to be attacked by wolves, cougars, and bears. Any creature or object whose appearance, proximity, or behavior triggers that instinctive fear can be targeted by a potentially lethal fight-back response.

## 1.2 POPULATION ECOLOGY AND WHY IT MATTERS WHEN TRYING TO DEFUSE CONFLICTS

Elk are long-lived animals: in the wild a Roosevelt elk may live as long as 12-15 years. The abundance of animals in an area's population responds to four flows: immigration, emigration, births, and deaths. Most pertinent to elk population management are the births and deaths, but it is very important to remember that the herd will move, use space, and select resources in order to accommodate all those very hungry mouths.

Nutritional or ecological carrying capacity (NCC or K) refers to the population size that an area's available resources (food) will support. Social or cultural carrying capacity is the number of animals a community of humans will tolerate, and often incorporates assessment of risks, economic damages, and other effects of the number of animals in a herd. These numbers can be quite different, and wildlife managers are challenged with balancing both.

Wildlife management in the United States is anchored in best-available science and in support of the Public Trust Doctrine, in which populations of our native wild fish and wildlife are managed in trust as extremely valuable resources for current and future generations of Americans. Professional science-based wildlife management focuses on populations and the habitat that sustains them over timescale of multiple human generations. As negative human-wildlife conflicts increase with human expansion, other methods to address "problem animals" can offer solutions that traditional wildlife management. Behavior modification and applied behavior analysis combined with wildlife science and human dimensions will provide an interdisciplinary powerhouse of possible techniques and solutions.

Regardless of species or setting, management options for wildlife-human conflicts distill to five basic approaches: prevention, blocking, deterrence, population management, and behavior modification. Ideally, managers can anticipate a looming conflict between wildlife and a resource, and initiate actions to prevent negative interactions before conflict ignites. Blocking involves physically barring animals' access to the space or resource. Deterrence uses signals to trigger animals' fear, distaste, or other avoidance instincts by deploying noises, visuals, physical hazing, bad tastes or smells, and other cues to avoid the resource. Population management can directly remove animals from the population or prevent recruitment by influencing birth rates. Most commonly with a game (harvestable) species, this is a lethal removal that reduces population size and thus the pressure on resources in an area. Finally, behavior modification uses animal learning theory to change the behavior of individuals within a population. The logistics of achieving a solution to a specific case vary in cost and difficulty depending on what species is involved and the scale of the problem.

## 2 METHODS

*The Subcommittee developed a list of management actions for potential use in addressing the conflicts between elk and humans in the Greater Clatsop Plains (*

Table 1). These potential management actions form the toolbox, and were drawn from Subcommittee expertise and research. The toolbox is based on current, historic, and innovative tools for managing elk-human conflicts across diverse landscapes and is intended to be used as a resource to adaptively manage the elk population in the Clatsop Plains project area.

The Subcommittee developed six scoring criteria (Table 2) to guide evaluation of individual management actions' appropriateness for use in a given location; scores for the Greater Clatsop Plains may not be the same as scores for other areas. The criteria provide a consistent way to address each management action by assigning a numerical score to each criterion (Table 2), and the Subcommittee evaluated each action for efficacy in the Greater Clatsop Plains. Of these actions, the Subcommittee then selected the top actions that are most likely to improve elk-human interactions in the Greater Clatsop Plains, which are presented here.

*Table 1. Management actions developed and evaluated by the Elk Management Subcommittee*

Management Action	Result	Connected Actions
<b>Non- Lethal Removal</b>		
Live Capture and Relocate	Not recommended	
<b>Lethal Removal</b>		
Targeted Controlled Hunt	ODFW tool	
General Antlerless Elk Season	ODFW tool	
Elk Damage Tag	ODFW tool	
Kill Permit	ODFW tool	
Culling – With Salvage	Recommended	Behavior modification plan
Targeted Removal of Problem Elk	Recommended	Behavior modification plan
Expansion of Hunting to Currently Prohibited Areas	Not recommended	
<b>Other Herd Reduction Strategies</b>		
Contraception	Not recommended	
Sterilization	Not recommended	
Supporting Predators	Not recommended	
<b>Infrastructure Strategies</b>		
Wildlife Crossings	Recommended	Habitat manipulation, fencing, behavior modification plan
Vertical Fencing	Recommended	Habitat manipulation, fencing, behavior modification plan
Double Fencing	Recommended	Habitat manipulation, fencing, behavior modification plan
<b>Habitat Manipulation</b>		
Use of Attractants	Recommended	Fencing, elk movement corridors, behavior modification plan
Use of Deterrents	Recommended	Fencing, elk movement corridors, behavior



			modification plan
Elk Movement Corridors	Recommended		Fencing, wildlife crossings, behavior modification plan
<b>Behavioral Modification</b>			
Hazing Permits	Recommended		Behavior modification plan, habitat manipulation
Behavior Modification Plan	Recommended		Infrastructure strategies, habitat manipulation, lethal removal, ordinances
<b>Regulatory Strategies</b>			
No Feeding Ordinance	Recommended		State Support of Wildlife Regulations
State Support of Local Wildlife Regulations	Not recommended		No Feeding Ordinance
Safe Distance Ordinance	Not recommended		

Table 2. Evaluation criteria, definitions and scoring criteria used to evaluate elk management actions.

Evaluation Criteria	Definitions	Scoring Criteria
<b>Safety and Damage</b>	How does this action contribute to decreasing risk to humans and property damage	-1 = increase risks to safety and damage, 0 = no change, 1= slight decrease in risk, 2 = significant decrease in risk
<b>Herd Size Reduction</b>	How does this action contribute to reducing the herd size over a five-year period	-1 = increase herd size, 0 = no change or slightly measurable decrease in herd size, 1= moderate measurable decrease in herd size 2 = significant measurable decrease in herd size
<b>Relative Cost Feasibility</b>	In general, what is the cost to implement the action	-1 very high, 0=high cost, 1 = moderate cost, 2=low or very minimal cost
<b>Biological Appropriateness</b>	How does this action conform with accepted wildlife practices and limits risk to animal populations	-1= not conforming with best available science, 0=minimally acceptable but high risk to animal(s), 1=acceptable but moderate risk to animal(s), 2 = acceptable but minimal to no risk to animal(s)
<b>Behavior Modification</b>	Will the action alter elk behavior	-1=increases undesirable behavior, 0=no change in behavior, 1=desired behavior is present, 2=desired behavior is present throughout population
<b>Sustainability</b>	How long the effects of an action will last	-1= no sustainable effect, 0=under 1 year, 1=1-5 years, 2= over five years

## 2.1 SCORING CRITERIA

The scoring criteria were developed to guide evaluation of individual management actions' appropriateness for use in a given location; scores for the Greater Clatsop Plains may not be the same as

scores for areas in other parts of the state. The criteria provide a consistent way to address each management action. Management actions were scored based on their impact to the evaluation criterion identified in Table 2. Each evaluation criterion was assigned a range of numerical scores and a description. Numerical scores ranged in whole integers from -1 to 2 and each integer was clearly defined based on the expected benefit or lack thereof (Table 2).

### 3 ELK MANAGEMENT ACTIONS

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This section describes the elk management actions, scores, and key discussion points in relation to Greater Clatsop Plains. Subcommittee composite scores (group median scores) for each management action are presented, as well as a more detailed description of the action and a summary of the evaluation criterion discussion that significantly influenced the score. Some management actions are more effective when used in combination with other actions, and those are highlighted.

#### 3.1 NON-LETHAL REMOVAL

##### 3.1.1 Live Capture and Relocation

This management action means to capture and relocate elk, at levels greater than annual recruitment (immigration and birth rates combined), to an area outside of their herd's typical home-range. While capture techniques vary, a typical capture site for elk in NW Oregon would include a baited corral trap with a remote-control that closes the corral door when triggered. Corral traps include a squeeze chute to facilitate handling and loading of animals. Use of a baited corral trap to facilitate capture generally provides less stress on animals than other, more active, techniques that require chasing or hazing of animals to get them to enter the trap; however, stress levels will increase once animals are in the trap even when chemical immobilization drugs are used to subdue individual animals.

**Subcommittee Median Score = -1**

**Related Management Actions:** None.

##### *Key Discussion Points*

While the general public might find this method more appealing because of its non-lethality, the Subcommittee determined that this isn't a biologically-appropriate method to reduce the population of large wildlife. There are significant concerns about disease transmission (Chronic Wasting Disease, Hoof-Rot Disease); in general, wildlife managers are increasingly avoiding wildlife transfers to prevent disease transmission. The Greater Clatsop Plains elk are in extremely close proximity to the elk hoof-rot disease outbreak in southwest Washington, and there is broad documentation of interchange of elk across the Columbia River. Relocation of elk could unintentionally transfer hoof-rot (or other diseases) to an unaffected population. Finding suitable locations to relocate elk is also problematic; there are limited areas to release them, as most areas with suitable habitat are already occupied with elk and experiencing elk-human conflicts. Additionally, elk herds quickly become "trap-wise", making each trapping attempt less effective than the previous one. Relocation is also a stressful event for large prey species like elk, and this action has questionable ethics beyond the "feel good" perception of the public.

## 3.2 LETHAL REMOVAL

### 3.2.1 Targeted Controlled Hunts

ODFW has administrative procedures to establish a specific recreational hunt in a geographic area with limited tag numbers to address herds for population reduction. This can be for purposes of harvesting biological surplus or to alleviate elk damage in specific areas. Management objectives can be addressed by adjusting the number of tags and the dates in which they are valid. Persistent hunting pressure on herds over time can modify their behavior causing them to utilize other areas. These tags are available to the general public who apply for and are successful in the ODFW controlled hunt drawing. Hunters with a controlled hunt tag must hunt on open public land or must gain permission to access open private lands. Possession of a controlled hunt tag does not give hunters permission to discharge a firearm when prohibited by local ordinances. ODFW District Wildlife Biologists have the discretion to propose controlled hunts, but proposals must be coordinated with ODFW's Wildlife Division before going to the Fish and Wildlife Commission for approval.

**Subcommittee Median Score = 6**

**Related Management Actions: 3.2.7**

#### *Key Discussion Points*

Due to the developed and densely populated areas within the Greater Clatsop Plains, there are significant public safety concerns with employing this option. ODFW indicated that broad public rifle hunting isn't currently employed west of HWY 101 in Clatsop Plains largely due to safety concerns. There may be opportunities east of Highway 101, but it is unclear whether or not hunting in this area would have any measurable reduction on elk on the west side. This could be further informed by radio-collaring elk on both sides of the highway. Overall, the feasibility of this action appears low.

### 3.2.2 General Antlerless Elk Season

ODFW has administrative procedures to establish general hunting seasons in a specific geographic area for specific period of the year. General hunting seasons are structured to occur every year during the same approximate time period provided that management objectives and damage reduction priorities are being met. ODFW implemented a new general antlerless elk season in some parts of the state starting in 2020. Tags are available over the counter to anyone who holds a hunting license, but hunters are strongly encouraged to have made prior arrangements with a private landowner to hunt on their land. Hunters can move from one designated area to another. In a general season hunt, there are typically no administrative controls over the number of tags that can be issued. Possession of a general antlerless elk season tag does not give hunters permission to discharge a firearm within city limits or other areas where the discharge of firearms is not allowed. ODFW District Wildlife Biologists have the discretion to propose general antlerless elk seasons, but proposals must be coordinated with ODFW's Wildlife Division before going to the Fish and Wildlife Commission for approval.

**Subcommittee Median Score = 6**

**Related Management Actions: 3.2.7**

### 3.2.2.1 *Key Discussion Points*

There are significant public safety concerns with employing this option, which allows for a theoretically unlimited number of tag holders to hunt, unlike a controlled hunt. Again, ODFW indicated that broad public rifle hunting isn't currently employed west of Highway 101 in Clatsop Plains largely due to those safety concerns.

### 3.2.3 Elk Damage Tags

Elk damage tags are issued by ODFW for the purpose of removing antlerless elk on private property receiving significant damage by elk. When a landowner can demonstrate significant damage to property has occurred, tags are issued by District wildlife staff to the landowner or designated agents. ODFW inspects damage in person and devises a hunt for that landowner. Damage tags are only good for the property experiencing damage. ODFW may issue numerous tags if damage persists, but will only issue tags, up to 5 at a time, per landowner, between August 1 and March 31. Damage tags are not issued within city limits or in areas where shooting safety is a concern.

**Subcommittee Median Score = 4**

### **Related Management Actions: 3.2.7**

#### *Key Discussion Points*

The Subcommittee questioned whether this option would result in meaningful reductions in herd size or damage given the lack of areas that this action could safely be utilized. ODFW indicated that this option is currently being employed in areas that meet the damage program guidelines and has not seen substantial benefits. This action will continue to be used by ODFW within the statutory requirements.

### 3.2.4 Kill Permits

Kill permits are an ODFW administrative tool that allows a landowner or their designated agent to lethally remove antlerless elk by any method providing that the meat remains salvageable for human consumption. Kill permits are issued to landowners who have destructive animals, such as elk, that can't be controlled through typical hunting methods. The permit allows take of elk day or night using legal or typically-illegal hunting methods (e.g. use of spot lights spotlights) and the meat is either donated to a charitable institution or remains with the landowner or designee provided certain conditions are met. Typically, only one or two kill permits are issued to an individual landowner. Kill permits can be issued year-round.

**Subcommittee Median Score = 3**

### **Related Management Actions: 3.2.5**

#### *Key Discussion Points*

While kill permits are a widely flexible tool for individual landowners, they are often not employed due to the requirements put on the landowner to salvage the meat for charity, as processing the meat in the local area is challenging. Additional logistical constraints include the capacity of local food banks to pay for USDA processing and the scarcity of local USDA certified processors. This action will continue to be used by ODFW within the statutory requirements.

### 3.2.5 Culling – With Salvage for Charitable Organization

Culling is a management tool that lies within the kill permit administrative authority of ODFW, but is implemented at a larger scale than individually issued kill permits as described in 3.2.4 above. Animals may be euthanized by contracted sharp-shooters (typically USDA Wildlife Services Agents) or trapped and then euthanized depending on the location and safety concerns. The first use of a program of this magnitude occurred in 2018 on agricultural land adjacent to the Cold Springs Wildlife Refuge.

Implementation of a program utilizing culling in city limits would come at the request of the local municipal jurisdictions to ODFW. ODFW would follow provisions outlined in the 2017 legislation related to urban deer control (SB 373) as it provides clear guidance for lethal removal requests. Cities would first need to pass an anti-feeding ordinance and then declare that a public nuisance exists. At that point, they could then petition ODFW for assistance (e.g. permitting, technical assistance) in reducing population levels. Under this program the meat would need to remain salvageable for human consumption and coordination with a potential charitable food recipient would need to occur. Costs for removal is not covered by ODFW.

**Subcommittee Median Score = 9**

#### **Related Management Actions: 3.2.4**

##### *Key Discussion Points*

This option was the highest scored option by the group. While it is a relatively new technique in Oregon, it has been successful when employed elsewhere. Much of the group acknowledged that this option has the highest likelihood for successful long-term reduction of herd size and corresponding damage to private lands. Constraints include the cost to hire personnel to implement the permit and the cost to process the elk meat for a charitable use.

### 3.2.6 Targeted Removal of Problem Elk

ODFW has the authority to remove elk that are creating acute or chronic safety and damage issues. This authority has been exercised in the past and will continue to be done in the future, particularly when safety issues arise. Meat is donated to charitable organizations when possible. Targeted removal of individual elk has no measurable effect on population levels.

**Subcommittee Median Score = 5**

#### **Related Management Actions: None**

##### *Key Discussion Points:*

This option wasn't highly ranked as a suitable tool to deal with elk at a population level, but will be continued to be employed by ODFW and OSP in response to individual animals that are known to be causing safety issues. It also isn't a suitable tool to have any long-term sustainable impacts to populations of elk. Input was provided by the Subcommittee on methods to continually improve ODFW response and clarify how our process works.

### 3.2.7 Expansion of Hunting to Currently Prohibited Areas

This action may require a cooperative agreement between ODFW and another public entity(ies) to allow for recreational hunting in currently prohibited areas. This action may require federal, state, or local

regulation changes to allow for the agreement to proceed. In state parks, hunting is only allowed in areas identified by administrative rule.

**Subcommittee Median Score = 4**

**Related Management Actions: 3.2.1, 3.2.2, 3.2.3**

*Key Discussion Points*

This option was not favored among Subcommittee members mainly due to the safety issues that could arise from hunting around populated areas and the likelihood of changing elk behavior by pushing them into denser human populated areas such as cities and neighborhoods.

### 3.3 OTHER HERD REDUCTION STRATEGIES

#### 3.3.1 Contraception

This management action involves the use of an immunocontraceptive vaccine to reduce elk pregnancy rates in the herd or population. Administering the vaccine first requires capturing the elk, usually through darting and sedating by a wildlife professional. Once the vaccine is administered, the elk is marked with an ear tag to signify that the elk has been treated. Use of sedation on wildlife carries inherent risk and it is likely that some elk will die in the process. Vaccines need to be registered with and approved for use by the FDA. Additionally, elk that are currently chemically immobilized are not safe for human consumption for 45 days after treatment. Immunocontraceptive vaccines may have different safety periods. An effective vaccination program to control population growth would likely involve treating 50% of the herd annually over a period of 15 years. Use of contraception in females could potentially increase the period of rutting behavior in bulls, creating potential for increased elk-human conflict during that time.

**Subcommittee Median Score = -2**

**Related Management Actions: None**

*Key Discussion Points*

The subcommittee agreed that this option would be expensive given the number of elk that would require handling in the area and that each animal would need to be re-treated annually. Effects of this treatment would also take significant time to decrease the population. Additionally, it would also be extremely difficult to capture enough elk to realize impacts to the population and damage\safety issues would persist in the interim.

#### 3.3.2 Sterilization

This management action involves the surgical sterilization of male and/or female elk in the herd or population. Surgical sterilization involves inherent risks to the animal with mortality rates that could approach 20% (National Park Service 2008). Animals that die as a result of the surgery would not be salvageable for human consumption due to the chemical sedation or other drugs administered during or immediately following surgery. National Park Service (2008) indicated that the cost per female elk was approximately \$10,000; however, that included the cost of radio-collaring treated animals. Surgical sterilization has not been used successfully in reducing the size of large elk populations but has been proposed as a means of population maintenance once initial removal efforts have been completed.

National Park Service. 2008. Draft Elk Management Plan and Environmental Impact Statement for Wind Cave National Park *citing personal communication*.

**Subcommittee Median Score = -1**

**Related Management Actions: None**

*Key Discussion Points*

The subcommittee had many of the same concerns as the previous management action (3.3.1.), but pointed out the main difference being surgical sterilization is permanent for the individual. The discussion touched on the fact that females would need to be treated. Treatment to males would likely only end up attracting unaltered males into the population. This action has not been implemented effectively elsewhere and the risk to individual animals is high. This method would also require highly trained staff and appropriate facilities to implement the surgery. The action would take several years to realize a population reduction and damage\safety issues would continue in the interim.

### 3.4 SUPPORTING PREDATORS

In non-urban settings, managing predators to maintain healthy predator-prey relationships is a common wildlife management strategy. The rationale behind this concept would be to look for opportunity to support predators of elk in balance with safety and damage concerns that might be generated as a result.

**Subcommittee Median Score = 1**

**Related Management Actions: None**

*Key Discussion Points*

This action was extremely difficult for the subcommittee to score since it was difficult to imagine how to support predators without creating more public safety issues. The group acknowledged that there are already cougars in Fort Stevens State Park, but that predation of elk is likely very low. Agency costs for predator response in public areas is high and extremely time consuming. This action was viewed rather unfavorably given high likelihood of increased public safety issues.

### 3.5 INFRASTRUCTURE STRATEGIES

#### 3.5.1 Wildlife Crossings

The purpose of this management action is to allow safe ingress and egress of elk across highways or busy roads by constructing one or more overpass or underpass structures. Wildlife crossings for elk and deer are typically located within existing wildlife travel areas and can be enhanced through use of fencing to "direct" elk to the structure location. Wildlife crossing have been shown to be beneficial to wildlife and have been responsible for reducing collisions with vehicles.

**Subcommittee Median Score = 5**

**Related Management Actions: 3.4.2, 3.4.3, 3.5.3**

*Key Discussion Points:*

The subcommittee discussed how this could be implemented locally, given the concentration of private land adjacent to highway 101. The group did like the idea of implementing some infrastructure strategies to keep elk off of highway 101 and provide an avenue for elk to migrate east of the highway into less populated areas. The public safety aspect of this action was a focus of this discussion. The subcommittee did acknowledge that this action would be very expensive and potentially difficult to implement, but could see its value when implemented in combination with some other management actions. Additionally, it was suggested that a wildlife crossing overpass, might also serve a tsunami safety area if constructed with that aspect in mind. This could provide an additional funding source for construction.

3.5.2 Vertical Fencing

Vertical fencing at least 8-feet high can be constructed to exclude elk from key areas or guide them towards wildlife crossings. Some municipalities may have restrictions on fence height and that would need to be addressed in advance. Vertical fence can be used in conjunction with other terrain manipulation (e.g. ditch or swale) to further inhibit elk from crossing. Fencing could displace elk to other problem areas if placement is not well thought-out.

**Subcommittee Median Score = 7**

**Related Management Actions: 3.4.1, 3.5.3**

*Key Discussion Points*

The subcommittee discussed how this technique only protects the land inside the fence and could increase issues for neighboring lands. While it was agreed to be the most effective technique for any one individual property, but if used at a larger scale it would need to be part of a more comprehensive plan that considers the use of wildlife corridors and other measures.

3.5.3 Double Fencing

Construction of double-fencing for elk exclusion consists of running two parallel sections of fence to create a vertical and horizontal barrier to elk movement. In contrast to one 8-foot vertical fence, a double-fence could theoretically be much shorter and aesthetically pleasing (e.g. split cedar rail). This would allow for use along existing sidewalks or other areas where appearance is of concern. More evaluation is needed to determine design parameters that would provide a suitable deterrence for elk and this is something that ODFW is currently working on. Fencing could displace elk to other problem areas if placement is not well thought-out.

**Subcommittee Median Score = 6**

**Related Management Actions: 3.4.1, 3.5.3**

*Key Discussion Points*

This was the same discussion as vertical fencing. However, with more research, this option could be used to implement around properties such as golf courses that would require a more aesthetically pleasing option to permanently keep elk out.



## 3.6 HABITAT MANIPULATION

### 3.6.1 Use of Attractants

This management action involves the creative use of plantings, structures, or other habitat treatments to draw elk to a desired location. Examples include development of hiding cover, identifying “security zones” where elk can be free from disturbance, and enhancement or planting of highly nutritious forage. The action would be used in conjunction with other strategies such as behavior modification, wildlife crossings, elk movement corridors and habitat manipulation by deterrents to attract elk to desired locations. This action should be done with sufficient forethought to prevent increasing the biological carrying capacity of the population.

**Subcommittee Median Score = 5**

**Related Management Actions: 3.4.1, 3.5.2, 3.5.3, 3.6.2**

#### *Key Discussion Points*

This option could be implemented in an area such as Fort Stevens State Park where there would be desire to provide a public wildlife viewing option. An added benefit of attractants could be increasing the time elk spend in areas where they are more tolerable and there is less public safety and damage concerns.

### 3.6.2 Use of Deterrents

This management action involves the creative use of plantings, structures, or activities to dissuade elk from a specific location. Examples include promoting non-palatable forage, reduction of hiding cover, and promoting activities that disturb elk. Development of thick impenetrable hedges could be used as a means of exclusion. The action would be used in conjunction with other strategies such as behavior modification, wildlife crossings, elk movement corridors and habitat manipulation by attractants to attract elk to desired locations.

**Subcommittee Median Score = 4**

**Related Management Actions: 3.4.1, 3.5.2, 3.5.3, 3.6.2**

#### *Key Discussion Points*

This action was not highly regarded by the subcommittee as an effective way to improve public safety and reduce damage but it could have some value in the context of a more comprehensive plan. However, promoting actions such as non-palatable forage and using thick hedges as barriers was discussed as viable options for small private homeowners in municipalities.

### 3.6.3 Elk Movement Corridors

Development of elk movement corridors would ideally involve many management actions and coordination with the Land Use Subcommittee Suitable to create a comprehensive approach to identifying where elk are desired (and not desired) and how to accommodate movements within an identified range that meets the needs of the communities and the elk. There may be federal funding under SB 3030 for infrastructure, such as fencing, to improve wildlife outcomes in municipalities.

**Subcommittee Median Score = 6**

**Related Management Actions: 3.4.1, 3.4.2, 3.4.3, 3.5.1, 3.5.2, 3.6.1, 3.6.2**

*Key Discussion Points*

The subcommittee agreed on generally high scores and liked how well this action could fit in combination with some other habitat-focused actions in the toolbox. It was identified this as a strong contender for the declaration of cooperation.

### **3.7 BEHAVIOR MODIFICATION**

#### **3.7.1 Hazing Permits**

Hazing permits are an ODFW-issued tool authorizing harassment of wildlife consistent with state and local law. Some examples of hazing tools include use of shotguns with birdshot, pyrotechnics, cracker-shells, blank shells, shaker cans filled with rocks, air horns, slingshots, paintball markers, pellet guns, and any other method that will create avoidance behavior in elk without causing lasting physical injury. Some of these techniques will cause short-term discomfort and pain, and that is allowed under hazing permits, although the permit is void if permanent injury occurs. The permits are limited by local ordinances, many of which prohibit discharge of a firearm (or any projectile, e.g., slingshot) in the city limits. When ODFW issues a hazing permit, the holder is advised to check their local ordinances. Warrenton now allows shooting with any projectile on one's own property with approval from the chief of police. Effective use of hazing permits can be done within a well-coordinated Elk Behavior Modification Plan (See 3.6.2).

**Subcommittee Median Score = 6**

**Related Management Actions: 3.6.2**

*Key Discussion Points*

The subcommittee discussed how these are being currently implemented and the advice given to the public by ODFW when they are issued permits. Consistent interpretation of local firearm ordinances was identified as a potential barrier to effective implementation. This concept would be brought up to the Cities of Warrenton and Gearhart for consideration.

#### **3.6.2 Elk Behavior Modification Plan**

This management action involves the development of one or more elk behavioral modification plans that may range in scope from site-specific plans to deal with a chronic elk issue to larger plans intended to cover broad spatial scales. An elk behavioral modification plan developed for the greater Clatsop Plains area may use the "Antecedent, Behavior, Consequence (ABC)" model as a tool to assist in developing a functional behavior assessment for problem elk in one or more areas (Note: The ABC Model can also be used to understand positive, or desirable behavior). The principle involves knowledge of the antecedent (A), or the event that immediately precedes a problem behavior (B), and the consequences (C) of that behavior. Understanding of the ABC's allows for development of remedies that may be targeted at modifying the antecedent, behavior, or consequence to generate a desired outcome.

These remedies would be developed within the context of the elk behavior modification plan and would need to happen consistently over time for aversive behavior treatment to work. For example, if hazing were determined to be the most suitable remedy to address a damage problem, the hazing permit

holder would need to understand that they must haze every single time or hazing won't work. ODFW does advise hazing permit holders that they need to be consistent. Most people aren't around consistently enough to haze every time. People may need to hire someone to do the aversive training with consistent (every time) hazing. It's not commonly done, but can be very powerful when used. Positive training is the opposite of aversive training—reinforced behavior results in a desired outcome for the animal. Requires the same consistency as aversive training.

**Subcommittee Median Score = 6**

**Related Management Actions: 3.6.1**

*Key Discussion Points*

The subcommittee discussed this in regards to the advice ODFW provided the public when they requested a hazing permit. A prepared handout was discussed being used in this location as a strategy to keep the hazing as consistent as possible.

### 3.8 REGULATORY STRATEGIES

#### 3.8.1 No-Feeding Ordinance

Adoption of local no-feeding wildlife ordinances are a valuable tool in keeping wildlife healthy, reducing habituation, and reducing the human-wildlife conflicts that often follows. An effective enforcement plan should start with community education that includes both residents and tourists, and then proceed to issuing warning or tickets as the individual situations warrant. It is important that the ordinance is enforced consistently to alter the behavior of both humans and elk. The City of Warrenton and the City of Gearhart have already adopted a no-feeding ordinance

**Subcommittee Median Score = 7**

**Related Management Actions: 3.6.2, 3.7.2**

*Key Discussion Points*

The subcommittee acknowledged that many of the elk-human issues are caused in part by people feeding elk, thus habituating them to human presence and discussed some of the more high profile and egregious cases of local elk-human interactions. This recommendation to be implemented by local governments was widely supported and the subcommittee noted that some municipalities had already passed them.

#### 3.8.2 State Support for Local Wildlife Ordinances

Currently, local ordinances, such as a no-feeding ordinance, can only be enforced by local law enforcement as there is no state prohibition against feeding deer and elk in cities or elsewhere. This action would seek a change in state law to either: 1) enact a statewide no deer/elk feeding statute, or (2) enact legislation that allows state enforcement of certain wildlife-related local ordinances. The purpose of this action would be to give local municipalities additional enforcement resources to help reduce factors that lead to human-wildlife conflicts.

**Subcommittee Median Score = NA**

**Related Management Actions: 3.7.1, 3.7.3**

### *Key Discussion Points*

This action was developed out of a discussion regarding the enforcement of local no feeding or safe distance ordinances and was identified as a potential tool for OSP to help local law enforcement agencies. This action was unscored.

#### 3.8.3 Safe Distance Ordinance

A safe distance ordinance consists of a locally-adopted regulation that restricts humans from approaching elk within a certain pre-defined distance. The purpose of this action is to modify human behavior to prevent negative interactions with elk, particularly during high risk periods such as the rut or calving seasons. This would be most suitable for areas open to the general public within the city limits of local municipalities. This action would be accompanied by a community education effort including signage, and then proceed to issuing warning or tickets as the individual situations warrant. Further research would need to be completed to determine if there is a model ordinance elsewhere.

**Subcommittee Median Score = 7**

**Related Management Actions: 3.7.1, 3.7.2**

### *Key Discussion Points*

This discussion was very similar to the no feeding ordinance discussion. The subcommittee noted that dog walkers and overzealous (tourist) photographers may get too close to elk, even inadvertently. Keeping humans at a safe distance from elk will reduce elk-human conflicts and the habituation of elk.

## 4 RECOMMENDATIONS

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### **Culling**

The subcommittee recognized the need for an initial population reduction in the vicinity of urban areas to address public safety. Currently, elk movement in the area is not yet well understood; data collection on that will inform future animal removal (i.e. if a herd moves, lethal options in remote areas may have more impact on urban problems).

### **Habitat Manipulation**

In natural areas where elk are desired (Fort Stevens State Park, North Coast Land Conservancy, Fort Clatsop), develop attractive forage areas, safe calving areas, and sheltering areas to support the elk herds and draw them away from urban areas. In addition, develop specific habitat deterrent options for private landowners could include undesirable or unpalatable landscaping.

### **Elk Movement Corridors**

Establishment of these areas will be important for providing safe transit for elk between properties where elk are desired. Additionally, the subcommittee recognized that the more time elk spend on properties where elk are desired and passing through designated elk movement corridors, that there will likely be a reduction in elk-human conflict.

### **Wildlife Crossings**

Elk-vehicle collisions on highway 101 through the project area represents one of the largest threats to public safety. Both ODOT and OSP collect collision data. While there is still elk-human conflict on properties on the east side of highway 101, there is much more native habitat for elk to use and the damage situations are generally easier to address with conventional tools. The subcommittee recognized the increase in public safety as well as the likelihood of reduced elk-human conflict if more elk within the project area spent more time east of highway 101 and the need to provide safe passage to these areas.

### **Behavior Modification Plan**

The subcommittee recognized the need to develop an integrated behavior modification plan to encourage elk to be more independent and less habituated from humans. Many of the recommendations outlined in the Declaration of Cooperation will directly impact the success of such a plan.

### **Hazing Permits**

While hazing permits are regularly issued by ODFW to private landowners and can be an effective tool to dissuade elk from an area, the subcommittee recognized the need for a unified approach within the entire project area. The subcommittee encourages local governments to take up the issues and work together to find common ground so residents within the project area are clear what type of hazing actions are legal within their local jurisdiction.

### **Vertical and Double Fencing**

Fencing may be an appropriate action in the future; double fencing has been shown to work in other ungulates, but is not yet proven for elk. Testing the efficacy of double fencing is a priority as part of elk exclusion. In the meantime, we recommend convening a stakeholder group to develop a comprehensive fencing plan in combination with development of elk movement corridors. Fencing options range from single parcels to joint ventures among multiple landowners, and fencing without an appropriate elk movement plan will negatively impact elk and will result in elk entrapment in undesired areas or separated from important resources.

### **No-Feeding Ordinance**

Both the elk management and human management subcommittees discussed the need for no-feeding ordinances within local governmental boundaries. While the elk management discussed this tool and broadly supported it, ultimately it was sent to the human management subcommittee to review and score.

# Human Management Intervention Toolkit

In support of the Oregon Solutions Clatsop Planes Elk Collaborative

November 15, 2021

Human Management Subcommittee

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# 1 INTRODUCTION

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The Oregon Solutions (Clatsop Plains Elk Collaborative) is seeking a comprehensive and creative plan to address chronic elk-human conflict in the Greater Clatsop Plains of Northwest Oregon. Negative elk-human interactions have been escalating in the area for the last decade, resulting in increasing public safety issues, elk-related property damage, and human-borne habituation of native elk. At the same time, the presence of elk in the Greater Clatsop Plains is an asset to the communities and ecosystems, with strong public support for retaining elk in the landscape. Finding a path that reduces conflicts, improves public safety, and improves the health and behavior of the elk herd, while complex, is the overarching goal of the Clatsop Plains Elk Collaborative. In order to efficiently and thoroughly address the challenge, the Clatsop Plains Elk Collaborative created Subcommittees for four topics: elk management, human management, data, and land use. The Human Management/Human Behavior Modification Subcommittee Toolbox has been created to increase safety by addressing the human side of human-elk interactions. Human activity and development in the Clatsop Plains region has helped make the area more attractive for elk. Many human/elk interactions that have been reported in the Clatsop Plains region are directly related not only to elk behavior, but human behavior as well. Uninformed individuals can get too close to elk, feed elk, plant vegetation that the elk consider prime food sources, stop their vehicles in the middle of the road or park unsafely to take photos of elk, or inadvertently place themselves and their pets in danger when elk are near. Unfortunately, these actions can impact not only the person doing these things, but neighbors and others in the community as well. The work of the subcommittee is urgent, as both anecdotal evidence and information gathered by the Elk Project Data Management Subcommittee show human-elk interactions, including vehicle collisions, appear to be increasing with time.

Human behaviors and activity have increased the potential for dangerous interactions with elk. The goal of the subcommittee is to inform and support the intentional use of best practices to help communities live safely in close proximity to elk and to help minimize the negative and risky interactions between elk and humans. The subcommittee's recommended tools can assist with modifying human behavior and also educate residents, visitors, and youth about elk and ways to protect property, pets, and human safety when elk are nearby.

## **Clatsop Plains Elk**

Oregon's elk are valued by Oregonians for their aesthetic, cultural significance, economic impact on tourism, and for their place in the ecosystem. The Greater Clatsop Plains elk are members of the Roosevelt subspecies, the largest-bodied group of elk in the United States. Mature males weigh in at 700-1100 lbs. and females weigh 580-630 lbs. Elk have been an important component in the Clatsop Plains' natural and human systems for centuries, critical to the forests and fields, indigenous peoples, and even as the life-saving resource that enabled the Lewis and Clark expedition to survive the winter of 1805-06.

Elk form reflects functional needs: their herbivorous diet created a skull specialized to clip and grind plant tissues, saliva that reduces the effects of plants' defensive chemicals, a four-chambered digestive system that incorporates microbes that digest nutrients that mammals otherwise cannot, and finally, cud-chewing behavior that helps maximize the nutritional gains of rumination. These features are adapted to the native plants of the Pacific Northwest, and are also very well-suited to decimating non-native landscaping.

Elk form complex relationships with plant communities on landscapes affected by natural and human-caused disturbances that changes vegetation availability. Elk select diets for both volume and quality to maximize nutritional gain from the seasonally-available sources of vegetation matter. They eat grass, forbs, and considerable amounts of browse, or the most nutritious twigs and leaves of shrubs – and fertilized landscape plants will attract the discerning elk palate. Elk breed August-October, known as the rut. Bulls (males) compete to gather and breed as many cows (females) as they can; their level of aggressive energy can be explosive, and easily misdirected against humans, vehicles, and pets during this time period. Fat stored during summer helps tide animals through the energy-drain in fall and winter. Reduced amounts of nutritious native forage often push elk into maintained landscapes Cows generally begin breeding during their third fall and give birth in May-June, and this time period is also susceptible to negative human-elk interactions. Cow elk are vigorous and well-armed mothers can become fixated on any dangers to their calves, perceived or real. Nursing and defense are energetically-expensive activities, so cow elk are hard-pressed, from late winter through summer, to get enough to eat for themselves, and their young calves, and pack on fat to survive the next winter. Although large-bodied and well-armed for self-protection, elk experience their lives as prey animals: they are expecting to be attacked by wolves, cougars, and bears. Any creature or object whose appearance, proximity, or behavior triggers that instinctive fear can be targeted by a potentially lethal fight-back response.

## 2 METHODS

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The Subcommittee developed a list of management actions for potential use in addressing the conflicts between elk and humans in the Greater Clatsop Plains. These potential management actions form the toolbox, and were drawn from Subcommittee expertise and research. The toolbox is based on current, historic, and innovative tools for managing elk-human conflicts across diverse landscapes and is intended to be used as a resource to adaptively manage the elk population in the Clatsop Plains project area.

The Subcommittee developed eight scoring criteria to guide evaluation of individual management actions' appropriateness for use in a given location. Scores for the Greater Clatsop Plains may not be the same as scores for other areas. The criteria provide a consistent way to address each management action by assigning a numerical score to each criterion, and the Subcommittee evaluated each action for efficacy in the Greater Clatsop Plains. Of these actions, the Subcommittee then selected the top actions that are most likely to improve elk-human interactions in the Greater Clatsop Plains, which are presented here.



## Scoring Matrix

The scoring matrix included the following criteria and each action is subjectively scored based on subcommittee discussions of specific scenarios.

- Safety – how much does the action contribute to decreasing risk to humans
- Property Damage - how much does the action contribute to decreasing property damage
- Relative Cost Feasibility – how costly will it be to implement the action
- Human Behavior Modification – how much human behavior change will the action require
- Willingness to modify behavior – how resistant (or not) individuals and communities may be to adopt or participate in the action
- Speed to adopt or adapt – how quickly will the impact of the action be seen, felt, or take effect
- Perceived ease to coordinate or implement the intervention – is there political will to implement the action; how complex or difficult will coordination or collaboration need to be to implement the action
- Sustainability – how long will the impact of an action last

The subcommittee scored the management actions based on the above criteria and developed a set of recommendations. The group considered the following points as context during its discussions.

- Educational management actions focus on helping people to understand elk ecology, leading to better appreciation of why elk behave in certain ways and therefore develop safer ways to interact with elk. Education and outreach, regardless of scores, form the foundation of the activities listed below and are essential to the overall efficacy of the subcommittee's recommendations.
- It is our goal to make sure people can be safe while maintaining elk as part of our community and recognizing them as a vital natural resource having positive economic and social impacts. The objective is to teach people about elk, help them understand why the elk are in our community, and give them appropriate ways to appreciate and coexist with elk.
- While education of residents is our highest priority, the committee feels it is important to continue to communicate with visitors. The subcommittee believes there will be difficulty effectively communicating elk-appropriate behavior to travelers that are moving through our communities for a short time and who may be focused on other aspects of their vacation experience.
- Property damage is manageable and often preventable. The committee has focused on things we as humans can do to deter elk from foraging on our properties and to educate residents and to give them tools to minimize damage on their properties by using elk-resistant planting and landscaping, elk exclusion fencing, and no feeding ordinances.

## 2.1 SCORING CRITERIA

The scoring criteria were developed to guide evaluation of individual management actions' appropriateness for use in a given location; scores for the Greater Clatsop Plains may not be the same as scores for areas in other parts of the state. The criteria provide a consistent way to address each

management action. Management actions were scored based on their impact to the evaluation criterion. Each evaluation criterion was assigned a range of numerical scores and a description. Numerical scores ranged in whole integers from -1 to 2 and each integer was clearly defined based on the expected benefit or lack thereof.

### 3 RECOMMENDATIONS

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#### *Human Management Subcommittee*

- Complete jurisdictional passing of no feeding ordinances
- Develop comprehensive no feeding guidance
- Develop and disseminate resident education materials on how to reduce interactions with elk.
- Work with residents on using best practices for elk appropriate landscaping and pet care.
- Develop and implement K-12 education materials, in coordination with local schools, that teach children about the history of elk in the Clatsop Plains, elk biology, and how to live with elk as citizens of the Clatsop Plains.
- Develop and disseminate visitor educational materials in collaboration with relevant partners
- Develop creative and effective fencing options for homeowners
- Develop and disseminate guidance on maintaining a safe distance from elk
- Establish new signage and investigate rumble strips at highly trafficked elk crossing areas on Highway 101. Explore the development of signage that is reactive to the presence of wildlife

#### **Recommended Management Actions**

The following recommendations focus on the human side of human-elk interactions in order to decrease the occurrence of negative and dangerous encounters between elk and humans by modifying human behavior. The listed recommended management actions include both actions that scored highly in the scoring process and some actions that scored lower, but which the subcommittee strongly believes should be implemented strategies. All of the management actions below are recommended for implementation regardless of how they scored.

#### ***High Scoring Management Actions (immediate implementation)***

##### No feeding ordinance

- Scored highest in the toolbox. Every jurisdiction can help reduce human-elk interactions by prohibiting the feeding of elk. The subcommittee believes this tool can be adopted and implemented quickly.

##### No feeding guidance

- Educating residents and visitors about the immediate and long-term costs and even danger of feeding of elk.

#### Resident education materials

- Provide information to local residents regarding elk biology, times when elk are more likely to be a danger to humans (rut, calving, reunited herds), and as detailed below, best practices for pets when elk are nearby, and elk-proof landscaping ideas.
- Landscaping guidance - landscaping and gardening practices of local residents can create conflict with elk, as the elk like to eat many plants used in landscaping, and therefore the plants can act to attract and hold the elk in place. The committee recommends the development of materials to help residents select plants that do not attract elk into their yards.
- Best practices for pets - educate residents and tourists about what to do with their pets when elk are nearby.

#### ***Medium to Low Scoring Management Actions (eventual implementation)***

##### Educational Strategies

- K-12 education materials – ranked in the mid-range by the committee. Develop curriculum, implement special events and/or class presentations. One of the reasons for the lower score was the need to obtain sustained buy-in from school districts whose assistance would be needed to incorporate such materials into a curriculum.
- Tourist education materials – ranked low by the committee. Although it scored low, that is because the committee has never done a tourist education effort and that uncertainty caused it to score lower in the ranking. The committee has stated that the low score does not mean a tourist education effort about elk, similar to the education effort about tsunami awareness, should not be a priority for local communities.
- Mass general education – ranked low by the committee. Actions include things like billboards or general information sheets

##### Develop fencing options

- Research large and small elk-exclusion fencing designs to provide landowners and local jurisdictions with different alternatives for fencing. Once this research is completed and options are identified, local jurisdictions can review and change their fencing regulations to allow landowners to fence their property in ways that will exclude elk from their yards by making fences taller or using techniques that keep elk from jumping fences. One of the reasons for the lower score was that just using taller, opaque fencing may create a “fortress-like” atmosphere that may not be consistent with the desired character of the community. Researching and using different fencing designs will help address this concern.

##### Safe distance from elk guidance

- Educational information that can be included in other educational materials and signage. It is important information to give to both residents and tourists.

Proximity sensors when elk near highway

- Utilize technology to help alert drivers when elk are near Highway 101. After doing some research the subcommittee found the technology is very expensive and does not always work well. This remains a management action that can be implemented in the future as the technology is developed further and costs decrease.